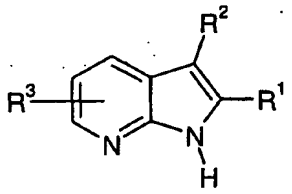
Claims

1. A compound of formula (I):



(I)

wherein:

R^1 represents phenyl or a five or six membered aromatic heterocyclic ring containing 1 to 3 heteroatoms selected independently from O, S and N; said phenyl or aromatic heterocyclic ring being optionally substituted by one or more substituents selected independently from halogen, C1 to 4 alkyl, C1 to 4 alkoxy, CO_2R^4 or a group –Q-L-M;

Q represents CO, O, NR^{12} or a bond;

L represents C1 to 4 alkyl optionally further substituted by OH or OMe; or L represents a bond;

M represents $NR^{13}R^{14}$ or OR^{15};

R^{13} and R^{14} independently represent H, C1 to 4 alkyl or $CONH_2$; or the group $-NR^{13}R^{14}$ together represents a saturated 5 to 7 membered azacyclic ring optionally incorporating one further heteroatom selected from O, S and NR^{16} and optionally further substituted by OH or 1-piperidinyl;

R^{16} represents H, C1 to 4 alkyl, CHO or C2 to 4 alkanoyl;

R^2 represents phenyl or a five or six membered aromatic heterocyclic ring containing 1 to 3 heteroatoms independently selected from O, S and N; said phenyl or aromatic heterocyclic ring being optionally substituted by one or more substituents selected independently from halogen, C1 to 4 alkyl, C1 to 4 alkoxy, OH, CN, CO_2R^6 and a group -W-X-Y;

W represents O or a bond;

X represents C1 to 4 alkyl, -CO-, $-CH_2CHOHCH_2-$ or a bond;

Y represents NR^7R^8;

or Y represents a saturated or partially unsaturated 4 to 7 membered ring, optionally including 1 or 2 heteroatoms independently selected from O, N and $S(O)_n$ and optionally incorporating 1 or 2 carbonyl groups; and optionally substituted by one or more substituents selected independently from OH, C1 to 4 alkyl, C1 to 4 alkoxy, CHO, C2 to 4 alkanoyl, C1 to 4 alkylsulphonyl or CO_2R^5;

or Y represents C1 to 4 alkoxy optionally further substituted by OH or C1 to 4 alkoxy;

R^3 represents H or one or two substituents selected independently from halogen, C1 to 4 alkyl, C1 to 4 alkoxy or cyano;

R^4, R^5 and R^6 independently represent H or C1 to 4 alkyl;

R^7 and R^8 independently represent H, C1 to 4 alkyl, $-CH_2CHOHCH_2OH$, CHO, C2 to 4 alkanoyl or a group –G–J–K wherein G represents –CO– or a bond; J represents C1 to 4 alkyl; and K represents $-NR^9R^{10}$ or $-CH(NH_2)CO_2R^{11}$;

R^9 and R^{10} independently represent H or C1 to 4 alkyl; or the group $-NR^9R^{10}$ together represents a saturated 5 or 6 membered azacyclic ring;

R^{11}, R^{12} and R^{15} independently represent H or C1 to 4 alkyl;

n represents an integer 0, 1 or 2;

and pharmaceutically acceptable salts thereof;

provided that:

(i) when R^3 is at the 6-position and represents C1 to 4 alkoxy and at the same time R^1 represents optionally substituted phenyl, then R^2 does not represent unsubstituted 4-pyridyl or unsubstituted 4-pyrimidyl; and

(ii) when R^2 represents 4-hydroxyphenyl or 4-hydroxy-3-pyridyl either optionally further substituted by halogen, C1 to 4 alkyl or C1 to 4 alkoxy, then R^3 represents cyano; and

(iii) the following three compounds are disclaimed - 2-(4-fluorophenyl)-3-(4-pyridinyl)-1H-pyrrolo[2,3-b]pyridine; 2,3-diphenyl-1H-pyrrolo[2,3-b]pyridine; and 4-methyl-2,3-diphenyl-1H-pyrrolo[2,3-b]pyridine.

2. A compound according to Claim 1 wherein R^3 represents halogen, methyl, methoxy or cyano.

3. A compound according to Claim 1 or Claim 2 wherein R^2 represents phenyl substituted by a group –W–X–Y and W represents O.

4. A compound of formula (I), according to any one of Claims 1 to 3, which is:

5-bromo-3-(4-methoxyphenyl)-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-3-(3-methoxyphenyl)-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)benzonitrile;

5-bromo-2-(2-furyl)-3-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

3-{4-[5-bromo-2-(2-furyl)-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl]phenoxy}-*N*,*N*-dimethylpropan-1-amine;

5-bromo-3-(4-morpholin-4-ylphenyl)-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-2,3-diphenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-2-(4-bromophenyl)-3-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-2,3-bis(4-methoxyphenyl)-1*H*-pyrrolo[2,3-*b*]pyridine;

N-(3-{4-[5-bromo-2-(2-furyl)-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl]phenoxy}propyl)-*N*,*N*-dimethylamine;

5-bromo-3-phenyl-2-(1,3-thiazol-2-yl)-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-3-furan-2-yl-1-*H*-pyrrolo[2,3-*b*]pyridine;

N-[5-(5-bromo-2-phenyl-1-*H*-pyrrolo[2,3-*b*]pyridin-3-yl)-fuan-2-ylmethyl]-acetamide;

5-bromo-3-(5-aminomethylfuran-2-yl)-2-phenyl-1H-pyrrolo[2,3-*b*]pyridine;

5-bromo-2,3-difuran-2-yl-1*H*-pyrrolo[2,3-*b*]pyridine;

methyl 5-(5-bromo-3-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)-1*H*-pyrrole-2-carboxylate;

5-bromo-3-phenyl-2-(1H-pyrrol-3-yl)-1H-pyrrolo[2,3-b]pyridine;

5-bromo-3-phenyl-2-(1,3-oxazol-2-yl)-1*H*-pyrrolo[2,3-*b*]pyridine;

3-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)phenol;

1-[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)phenoxy]-3-[(2-pyrrolidin-1-ylethyl)amino]propan-2-ol;

1-[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)phenoxy]-3-pyrrolidin-1-ylpropan-2-ol;

5-bromo-3-{4-[2-(1-methylpyrrolidin-2-yl)ethoxy]phenyl}-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-2-phenyl-3-[4-(2-pyrrolidin-1-ylethoxy)phenyl]-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-3-[4-(2-morpholin-4-ylethoxy)phenyl]-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-3-[3-(2-morpholin-4-ylethoxy)phenyl]-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

3-[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)phenoxy]-*N*,*N*-dimethylpropan-1-amine;

5-bromo-3-{4-[2-(2-methoxyethoxy)ethoxy]phenyl}-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-bromo-3-{3-[2-(1-methylpyrrolidin-2-yl)ethoxy]phenyl}-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

3-{4-[3-(dimethylamino)propoxy]phenyl}-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine-5-carbonitrile;

5-{[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)phenoxy]methyl}-1,3-oxazolidin-2-one;

3-{4-[3-(dimethylamino)propoxy]phenyl}-2-(4-methoxyphenyl)-1*H*-pyrrolo[2,3-*b*]pyridine-5-carbonitrile;

(3-{4-[5-bromo-2-(4-methoxy-phenyl)-1*H*-pyrrolo[1,3-*b*]pyridin-3-yl]-phenoxy}-propyl)-dimethylamine;

3-[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)phenoxy]propan-1-amine;

5-bromo-3-(4-aminomethylphenyl)-2-phenyl-1H-pyrrolo[2,3-b]pyridine;

5-bromo-3-[4-(4,5-dihydro-1H-imidazol-2-yl)phenyl]-2-phenyl-1H-pyrrolo[2,3-b]pyridine;

5-bromo-3-[4-(4,4-dimethyl-4,5-dihydro-1*H*-imidazol-2-yl)phenyl]-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine;

N-(2-aminoethyl)-4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)benzamide;

3-[[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)benzyl](1,2-dihydroxypropyl)amino]propane-1,2-diol;

4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)benzoic acid;

N^5-[4-(5-bromo-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridin-3-yl)benzyl]glutamine;

3-(4-hydroxyphenyl)-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine-5-carbonitrile;

3-[4-(aminomethyl)phenyl]-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine-5-carbonitrile;

3-(4-morpholin-4-ylphenyl)-2-phenyl-1*H*-pyrrolo[2,3-*b*]pyridine-5-carbonitrile;

3-(4-hydroxyphenyl)-2-(4-methoxyphenyl)-1*H*-pyrrolo[2,3-*b*]pyridine-5-carbonitrile;

5-bromo-2-phenyl-3-pyrrol-1-yl-1H-pyrrolo[2,3-b]pyridine;

5-cyano-2-(4-methoxy-phenyl)-3-pyrrol-1-yl-1H-pyrrolo[2,3-b]pyridine;

5-bromo-3-(2,5-dimethyl-pyrrol-1-yl)-2-phenyl-1H-pyrrolo[2,3-b]pyridine;

3-(4-methoxyphenyl)-2-phenyl-1H-pyrrolo[2,3-b]pyridine-5-carbonitrile;

{3-[4-(5-methyl-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)phenoxy]propyl}dimethylamine;

{3-[4-(5-fluoro-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)phenoxy]propyl}dimethylamine;

2-{4-[3-(dimethylamino)propoxy]phenyl}-4-methyl-3-pyridin-3-yl-1H-pyrrolo[2,3-b]pyridine-5-carbonitrile;

5-chloro-2-[5-(piperazin-1-ylcarbonyl)-1H-pyrrol-3-yl]-3-pyridin-3-yl-1H-pyrrolo[2,3-b]pyridine;

5-chloro-2-[5-(piperazin-1-ylcarbonyl)-1H-pyrrol-3-yl]-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridine;

{3-[4-(4,5-dichloro-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)phenoxy]propyl}dimethylamine;

{3-[4-(5-bromo-4-methyl-3-pyridin-3-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)phenoxy]propyl}dimethylamine;

5-chloro-3-pyridin-3-yl-2-(1H-pyrrol-2-yl)-1H-pyrrolo[2,3-b]pyridine;

5-chloro-3-pyridin-3-yl-2-(1H-pyrrol-3-yl)-1H-pyrrolo[2,3-b]pyridine;

5-chloro-4-methoxy-3-pyridin-3-yl-2-(1H-pyrrol-3-yl)-1H-pyrrolo[2,3-b]pyridine;

5-chloro-2-(6-chloropyridin-3-yl)-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridine;

(2-{[5-(5-chloro-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)pyridin-2-yl]oxy}ethyl)methylamine;

N-[5-(5-chloro-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)pyridin-2-yl]-N,N',N'-trimethylpropane-1,3-diamine;

N'-[5-(5-chloro-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-2-yl)pyridin-2-yl]-N,N-dimethylpropane-1,3-diamine;

N-{3-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]propyl}-*N*,*N*-dimethylamine;

{3-[4-(5-chloro-4-methoxy-3-pyridin-3-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]propyl}dimethylamine;

N-(2-{[5-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)pyridin-2-yl]oxy}ethyl)urea;

2-{[5-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)pyridin-2-yl]oxy}ethanol;

2-[6-(4-acetylpiperazin-1-yl)pyridin-3-yl]-5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-chloro-3-(4,5-dihydropyrimidin-5-yl)-2-[6-(4-methylpiperazin-1-yl)pyridin-3-yl]-1*H*-pyrrolo[2,3-*b*]pyridine;

5-chloro-3-(4,5-dihydropyrimidin-5-yl)-2-(6-morpholin-4-ylpyridin-3-yl)-1*H*-pyrrolo[2,3-*b*]pyridine;

1-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]-3-(4-methylpiperazin-1-yl)propan-2-ol;

1-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]-3-(dimethylamino)propan-2-ol;

1-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]-3-morpholin-4-ylpropan-2-ol;

1-{3-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]-2-hydroxypropyl}pyrrolidin-3-ol;

1-(1,4'-bipiperidin-1'-yl)-3-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]propan-2-ol;

{3-[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenoxy]-2-methoxypropyl}dimethylamine;

[4-(5-chloro-3-pyrimidin-5-yl-1*H*-pyrrolo[2,3-*b*]pyridin-2-yl)phenyl][2-(4-methylpiperazin-1-yl)ethyl]amine;

5-chloro-2-(1*H*-pyrazol-4-yl)-3-pyridin-3-yl-1*H*-pyrrolo[2,3-*b*]pyridine;

5-chloro-2-{4-[3-(dimethylamino)propoxy]phenyl}-N-methyl-3-pyrimidin-5-yl-1H-pyrrolo[2,3-b]pyridin-4-amine;

or a pharmaceutically acceptable salt of any one thereof.

5. A compound of formula (I), according to Claim 1, or a pharmaceutically acceptable salt thereof, for use as a medicament.

6. A pharmaceutical formulation comprising a compound of formula (I), as defined in any one of Claims 1 to 4, or a pharmaceutically acceptable salt thereof, optionally in admixture with a pharmaceutically acceptable diluent or carrier.

7. A method of treating, or reducing the risk of, a human disease or condition in which inhibition of Itk kinase activity is beneficial which comprises administering to a person suffering from or susceptible to such a disease or condition, a therapeutically effective

amount of a compound of formula (I), as defined in any one of Claims 1 to 4, or a pharmaceutically acceptable salt thereof.

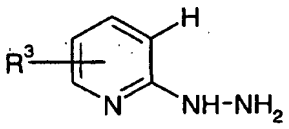
8. The use of a compound of formula (I) as defined in any one of Claims 1 to 4, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment or prophylaxis of human diseases or conditions in which inhibition of Itk kinase activity is beneficial.

9. The use according to Claim 8 wherein the disease is asthma.

10. The use according to Claim 8 wherein the disease is allergic rhinitis.

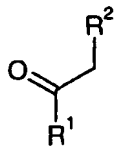
11. A process for the preparation of a compound of formula (I), as defined in any one of Claims 1 to 4, and optical isomers and racemates thereof and pharmaceutically acceptable salts thereof, which comprises:

a) reaction of a compound of formula (II):



(II)

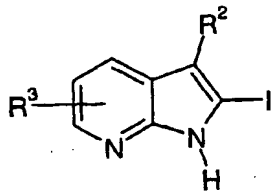
in which R^3 is as defined in Claim 1, with a compound of formula (III):



(III)

in which R^1 and R^2 are as defined in Claim 1; or

b) arylation of a compound of formula (IV)



(IV)

wherein R^2 and R^3 are as defined in Claim 1, with a boronic acid of formula R^1-$B(OH)_2$ wherein R^1 is as defined in Claim 1;

and where desired or necessary converting the resultant compound of formula (I), or another salt thereof, into a pharmaceutically acceptable salt thereof; or converting one compound of formula (I) into another compound of formula (I); and where desired converting the resultant compound of formula (I) into an optical isomer thereof.